

Two new species of *Erica* (Ericaceae) from the Langeberg, Western Cape, South Africa

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ABSTRACT

Two new species of the genus *Erica* L. from the north-facing slopes of the Langeberg are described—*E. turneri*, known only from the type locality on Zuurbraak Mountain and *E. euryphylla*, occurring on the same mountain slope, as well as on the middle north-facing slopes of Hermitage Peak near Misty Point in the Marloth Nature Reserve above Swellendam.

INTRODUCTION

The two species described in this paper are placed in section §*Ceramia* in which there are many species associated with damp, shaded or wet habitats. Most are soft, low shrublets, either erect and compact or diffuse and sprawling, with long, delicate main branches and often with open-backed leaves (Oliver & Oliver 2002). Both new species possess recaulescent bracts and bracteoles and have broad, flat leaves with distinctly thinned midribs towards the apices, allying them morphologically with *E. oxycoccifolia* and *E. cordata* respectively, rather than with the *E. planifolia* group, in which the bract is not recaulescent and is leaf-like and the leaves have apically thickened midribs.

Erica turneri E.G.H.Oliv., sp. nov., foliis 3-natis, ramis foliis bractea bracteolisque pilis glandulosis simplicibus, bractea recaulescenti, corolla $\pm 3\text{--}4 \times 2.5\text{--}3.5$ mm pilis brevibus simplicibus, ovario pilis sparsis. Figura 1.

TYPE.—Western Cape, 3320 (Montagu): Langeberg Range, Zuurbraak Mountain west of Tradouw Pass, north-facing slopes above Farm Sandrift, 774 m, (–DC), 30 August 2003, Turner 792 (NBG, holo.; BOL, K, iso.).

Plants up to 450 mm tall, laxly erect to sprawling, entwined, single-stemmed reseeder. *Branches:* several lax, spreading main and numerous entwined secondary branches; stems, younger and older with sparse, short, simple and gland-tipped hairs, no infrafoliar ridges, internodes $\pm 5\text{--}10\text{--}(17)$ mm long. *Leaves* 3-nate, ovoid to obovoid, $\pm 3\text{--}4 \times 1.0\text{--}2.5$ mm, flat, open-backed, abaxially with short, simple and gland-tipped hairs, midrib slightly thickened in basal and median portions, adaxially with short, simple and occasional short, gland-tipped hairs, green, margins slightly thickened abaxially, ciliate, with short simple and gland-tipped hairs; petiole $\pm 0.5\text{--}0.75$ mm long, yellowish green. *Inflorescence:* flowers 1 to 3-nate in 1(2) whorls at ends of main branches and secondary branchlets, the latter long or highly reduced; pedicel ± 8 mm long, green turning reddish, with short, simple and gland-tipped hairs; bract partially recaulescent, basal to median, leaf-like, narrowly obovate, \pm

0.7 mm long, open-backed, abaxial and adaxial surfaces and margins with short, dense, simple and gland-tipped hairs, pale green; bracteoles 2, basal to median, longer than bract, linear, ± 0.8 mm long, open-backed, leaf-like, abaxial and adaxial surfaces and margins with short, dense, simple and gland-tipped hairs, pale green. *Calyx* 4-lobed; sepals adpressed, ovate, open-backed, $\pm 1.5\text{--}2.0$ mm long, adaxially glabrous, abaxially with short, simple and gland-tipped hairs, margins slightly thickened, ciliate, with short simple and gland-tipped hairs, green. *Corolla* 4-lobed, broadly cup-shaped to slightly ovoid, $3\text{--}4 \times 2.5\text{--}3.5$ mm, with short simple hairs ($\pm 0.1\text{--}0.4$ mm long), translucent white tinged pink in upper half and lobes, becoming deeper pink upon exposure to sunlight and when older, lobes erect, acute, margins smooth. *Stamens* 8, free, included; filaments linear, ± 1.5 mm long, with a slight apical bend, glabrous, white; anthers dorsally fixed at base, bipartite, thecae erect, subfalcately rectangular-elliptic in lateral view, $\pm 0.8\text{--}1.0$ mm long, sparsely aculeate, golden brown with reddish tinge on dorsal ridge; appendages pendulous, dentate, narrowly obcuneate, ± 0.7 mm long, sparsely aculeate, dorsally fixed at bases of thecae, white, often tinged red, pores $\pm 0.25\text{--}0.3$ mm long; pollen in tetrads. *Ovary* 4-locular, subturbinate, slightly flattened, ± 0.85 mm long, with sparse lanate hairs, green turning red; ovules 7 or 8 per locule, placenta apical, nectaries, basal, green; style filiform, ± 2 mm long, glabrous, exerted, occasionally with sparse lanate hairs on upper 0.4 mm, white to pale green, tinged red apically; stigma subcapitate, reddish. *Fruit* a dehiscent capsule, broadly cylindrical-ellipsoid, ± 0.85 mm long, sparsely lanate, pale cream-coloured, valves thin and brittle, spreading to $\pm 45^\circ$, septa $\pm 60\%$ on valve, 40% on columella. *Seeds* ellipsoid, ± 0.3 mm long; testa yellowish brown, smooth, shiny; cells irregularly elongate, $50\text{--}80 \times 25\text{--}40$ μm , anticlinal walls unevenly jigsawed, periclinal walls with numerous small pits. *Flowering time:* May to August. Figure 1.

Diagnostic features and discussion: *Erica turneri* is remarkably similar in superficial appearance to *E. oxycoccifolia* Salisb., a species endemic to the Cape Peninsula, as well as to the following species described in this paper, *E. euryphylla*. Character similarities include 3-nate, broad, open-backed leaves, $3\text{--}5 \times 1\text{--}3$ mm, small, finely hairy, cup- to open cup-shaped, white to pink flowers, $3\text{--}4$ mm long, as well as a soft, lax, spreading, intertwined habit. Upon closer inspection however, *E. turneri* possesses

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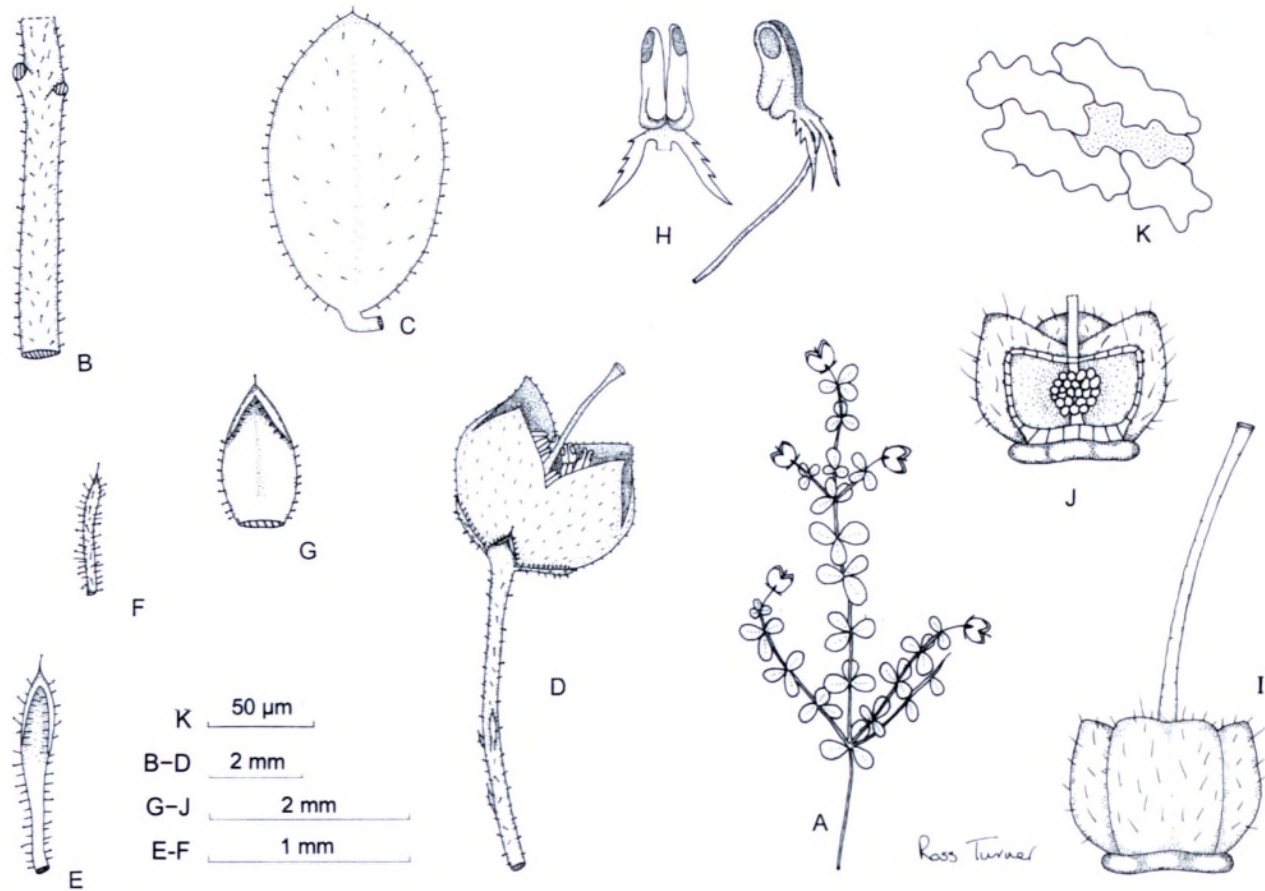


FIGURE 1.—*Erica turneri*, Turner 792. A, flowering branch, natural size; B, stem; C, leaf, abaxial view; D, flower; E, bract; F, bracteole; G, sepal, abaxial view; H, stamen, front and side views; I, gynoecium; J, ovary with one valve removed; K, testa cells. Scale bars: B–D, G–J, 2 mm; E, F, 1 mm; K, 50 μ m. Artist: R.C. Turner.

stems with short, simple and gland-tipped hairs, abaxial leaf surfaces with short, simple and gland-tipped hairs, pedicels with short, predominantly gland-tipped, occasionally simple hairs, a turbinate, sparsely hairy, 4-locular ovary with 7 ovules per locule, and sparsely aculeate, prognathous anthers with ± 0.7 mm long, pendulous, dentate appendages. *E. oxycoccifolia* differs in having a glabrous stem, glabrous abaxial leaf surfaces, glabrous pedicels, smooth, muticous anthers and a globose, glabrous, 4-locular ovary with 10 ovules per locule, whereas *E. euryphylla* has stems with long, lanate and occasionally gland-tipped hairs, abaxial leaf surfaces with long woolly hairs, pedicels with long, lanate and occasionally gland-tipped hairs, smooth, muticous anthers, and a globose, 4-locular ovary with 16 ovules per locule.

Pollination syndrome: the pollination syndrome of *Erica turneri* is unresolved. The presence of anther appendages and well-developed nectaries suggest entomophily, although no potential pollinators, flying or crawling, have been observed during visits to the ten known stands. It seems improbable, however, that a flying insect would be able to penetrate the tangled, glandular leaves and stems of the species, to reach flowers that are often pressed against rock faces, or entirely contained by the plants' aforementioned habit. Preliminary studies into the pollination syndromes of *E. limosa* L. Bolus and *E. salteri* L. Bolus, suggest that large ants may play an important role in the pollination of moisture-loving *Erica* species with a low, diffuse, entwined habit, as well as with small (1–5 mm long), cup-shaped flowers (Turner pers. obs.).

Distribution and habitat: *Erica turneri* appears to be confined to the catchment area of the Klein-Sandrivier on the middle north-facing slopes of Zuurbraak Mountain in the Langeberg Range, ± 11 km southwest of Barrydale (Figure 2) (Turner pers. obs.). The species has been seen at altitudes ranging from 580–950 m, on a substratum of quartzitic Table Mountain Sandstone (Turner pers. obs.). Plants occur in seasonally damp or wet, mostly shady crevices and recesses at the bases of rocks and rock

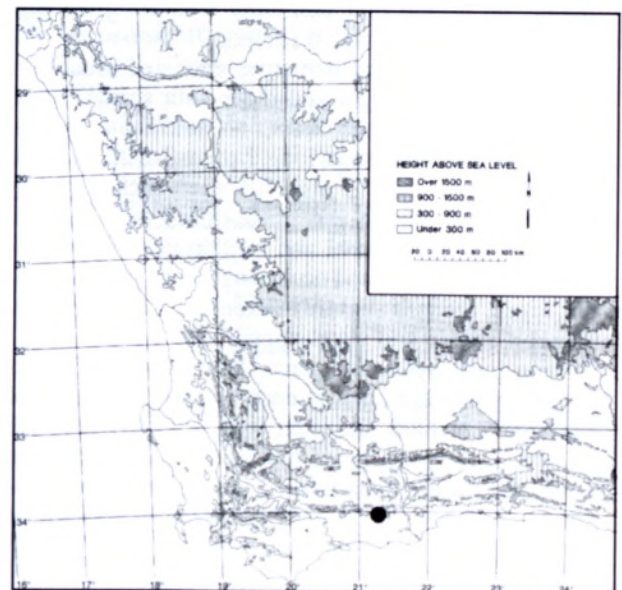


FIGURE 2.—Known distribution of *Erica turneri*.

ledges. This type of microhabitat often provides only a small amount of derived quartzitic sand and darker, peatty, organically derived accumulate in which plants may grow. It is unusual, although not unique, for an *Erica* species with a delicate growth form and markedly open-backed leaves such as *E. turneri*, to inhabit hotter, drier, north-facing mountain slopes, as well as to enjoy a generally north-facing aspect. However, the species grows in seasonally wet or damp, mostly shady crevices and recesses at the bases of rocks and rock ledges, resulting in the majority of specimens receiving potentially direct sunlight only in autumn and midwinter, the period over which the species flowers. Morphologically allied taxa such as *E. oxycoccifolia*, *E. physophylla* Benth. and *E. utriculosa* L. Bolus, which are by contrast confined to damp, shady, montane, south-facing habitats on generally wetter, south-facing slopes, would receive their most direct sunlight as well as optimum moisture availability in spring to early midsummer, the seasons in which their flowering occurs. Although the south and upper north-facing slopes of Zuurbraak Mountain receive much precipitation and resulting seepage, the middle and lower north-facing slopes are comparatively dry.

Stands of *E. turneri* growing in the non-perennial, eastern tributaries of the Klein-Sandrivier do not receive direct runoff or seepage from the wetter, upper slopes, and plants in these more exposed habitats display reddish green leaves and produce flowers with a pink tinge at an earlier stage than well-shaded specimens. Stands growing in the Klein-Sandrivier Kloof enjoy a cooler, moister microclimate and the only south-facing specimens of the entire population are found in this kloof, in a steep, damp side gully. Here plants form low, matted 'hedgerows' at the base of rock faces, individual plants attaining dimensions of up to 450 × 400 mm. Given the populations' general aspect and habitat however (Turner pers. obs.), it is apparent that the species is capable of surviving some relatively dry periods. It is therefore surprising, given its postulated relationship with other species of §*Ceramia*, that in this situation, the species has almost totally open-backed leaves. In its specialized microhabitat, *E. turneri* grows in association with other delicate, lax, shade-loving species such as *Troglophyton capillaceum* (Asteraceae), *Centella macrodis* (Apiaceae) and *Gleichenia polypodioides* (Gleicheniaceae), as well as other moisture-loving species such as *Lobelia neglecta* (Lobeliaceae), *Drosera capensis* (Droseraceae), *Todea barbara* (Osmundaceae), *E. caffra* L., *E. cubica* L., *E. hispidula* L., *E. tenuis* Salisb. (Ericaceae), *Berzelia lanuginosa* and *Raspalia virgata* (Bruniaceae) and several low Restionaceae species. The following species described in this paper, *E. euryphylla*, although growing on the same mountain slope, does not occur in direct association with *E. turneri*. Furthermore, the north- and south-facing slopes of Zuurbraak Mountain together support at least 34 *Erica* species (Turner pers. obs.), nine of these endemic to the Langeberg.

Etymology: this species is named after its discoverer, Ross Turner, who is also the co-author of this paper. He has devoted considerable time and energy to the tracking down, recording and studying of many *Erica* species, especially the rare ones.

Paratype material

WESTERN CAPE.—3320 (Montagu): Langeberg Mountains, Zuurbraak Mountain west of Tradouw Pass; steep gully in Klein-Sandrivier Kloof, above Farm Sandrift, 616 m, (–DC), 26 August 2004, Turner 107 (NBG).

Erica euryphylla R.C. Turner, sp. nov., foliis 3-natis costa in mediano basique parum crassiore, ramis foliis bractea bracteolisque pilis brevibus sparsis glandulosis et simplicibus, bractea recaulescenti, corolla ± 3–4 × 2.5–3.5 mm pilis brevibus simplicibus et interdum pilis glandulosis, antheris muticis interdum calcaribus minutis, ovario pilis sparsis. Figura 3.

TYPE.—Western Cape, 3320 (Montagu): Swellendam Hiking Trail, in shelter of overhanging rock along path between Boskloof and Goedgeloof huts, Langeberg Mountains, 3500–4000 ft [1 060–1 220 m], (–CD), 5 December 1983, Esterhuysen 36152 (BOL, holo.; NBG, iso.).

Plants up to 300 mm tall, soft, laxly erect, single-stemmed reseeder. *Branches*: several, erect, lax main with short, lax, secondary branches; stems, younger and older with sparse, short, simple and gland-tipped hairs, no infrafoliar ridges, internodes ± 5–10(–14) mm long. *Leaves* 3-nate, ovate to obovate, 3–5 × 1–3 mm, flat, open-backed, green, abaxially with long, dense, woolly hairs, midrib slightly thickened especially in basal and median portions, adaxially with long, simple and gland-tipped hairs, margins slightly thickened abaxially with long, simple and gland-tipped hairs; petiole ± 0.8–1.0 mm long, yellowish green. *Inflorescence*: flowers (1–)3-nate in 1 to 5 whorls, umbel-like at ends of main and secondary branchlets; pedicel ± 3.5–5.0 mm long, rosy pink, with long, lanate, simple and gland-tipped hairs; bract partially recaulescent, basal to median, when basal leaf-like, ± 2–3 × 1–2 mm, open-backed, green, abaxially with long, woolly, simple hairs and adaxially with long, simple and gland-tipped hairs, when median narrowly obovate, ± 0.7 × 0.5 mm, abaxially glabrous, adaxially with long, simple and gland-tipped hairs and margins with long, simple and gland-tipped hairs; bracteoles 2, ± median, narrowly obovate, ± 0.8 mm long, slightly longer than bract when bract in median position, partially open-backed, abaxially glabrous, margins and adaxial surface with long, simple and gland-tipped hairs. *Calyx* 4-lobed; sepals partially fused at bases, adpressed, narrowly spatulate, ± 1.2–2.0 mm long, open-backed, pink, green apically, abaxially with short, woolly and long, simple and gland-tipped hairs, adaxially glabrous, margins slightly thickened with long, pilose hairs with red apical glands. *Corolla* 4-lobed, open cup-shaped to slightly urn-shaped, 3–4 × 2.5–3.5 mm, viscid, with sparse, simple and occasionally gland-tipped hairs, ± 0.1–0.4 mm long, pale to rosy pink, margins smooth, lobes erect, acute, entire. *Stamens* 8, free, included; filaments linear, ± 1.8 mm long, erect, with a slight apical bend, glabrous, white; anthers basifixed, bipartite, erect, muticous, occasionally with minute, aculeate, spreading appendage near apex of filament, glabrous, golden brown, thecae ± 0.8–1.0 mm long, pores apical, ovoid, ± 0.25–0.32 mm long; pollen in tetrads. *Ovary* 4-locular, ovoid, ± 1 mm long, viscid, green turning red, with short, dense, simple lanate and occasionally gland-tipped hairs; nectaries basal, yellowish green turning red; ovules ± 16 per locule, placenta apical; style simple, ± 3 mm

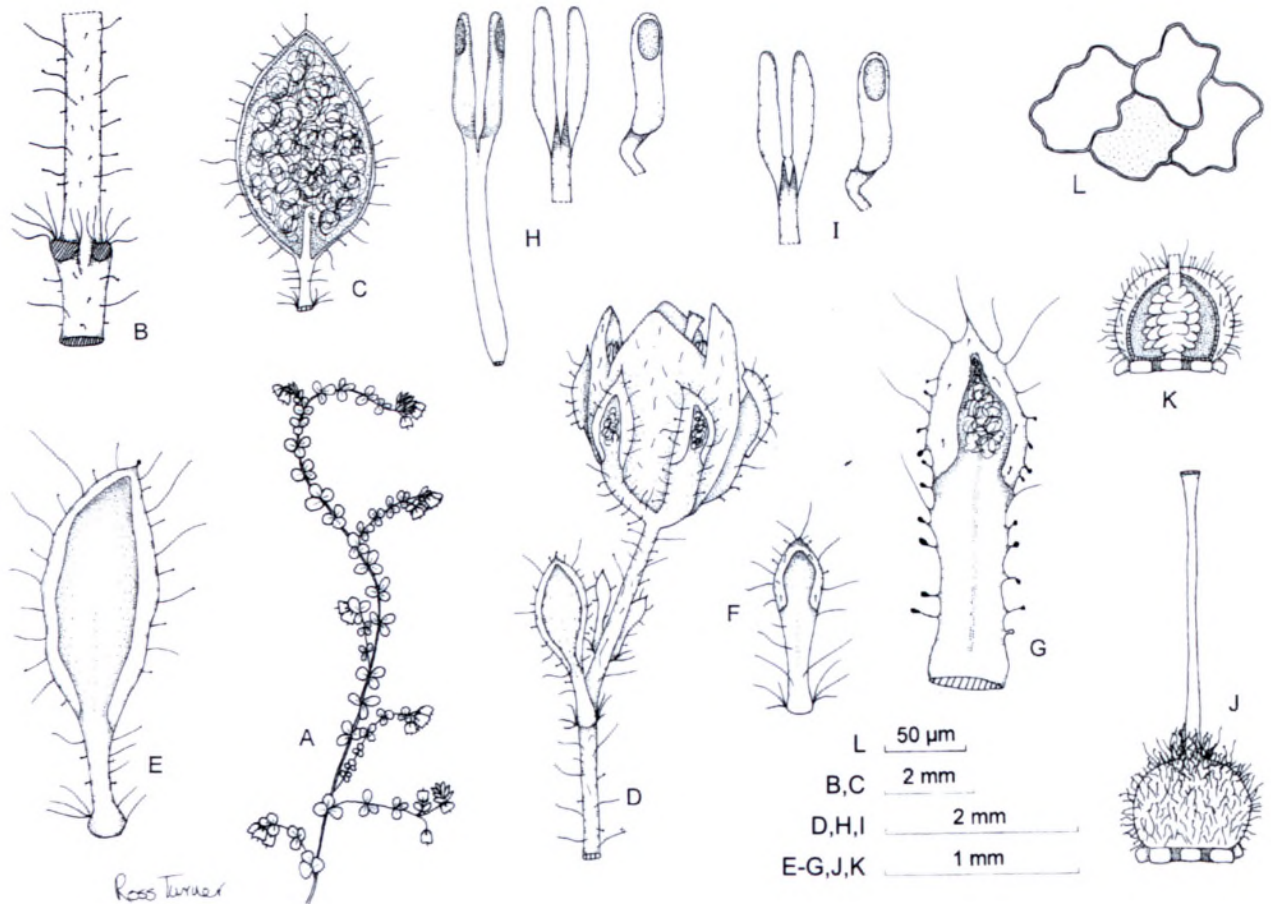


FIGURE 3.—*Erica euryphylla*, Turner 799. A, flowering branch, natural size; B, stem; C, leaf, abaxial view; D, flower; E, bract; F, bracteole; G, sepal, abaxial view; H, stamen, front, side and back views; I, anther, side and back views showing minute appendages; J, gynoecium; K, ovary with one valve removed; L, testa cells. Scale bars: B–D, H, I, 2 mm; E–G, J, K, 1 mm; L, 50 μ m. Artist: R.C. Turner.

long, exserted, glabrous, pink; stigma capitellate, reddish purple. *Fruit* a dehiscent capsule, ± 1 mm long, ovoid, pale brown to cream-coloured with short, lanate hairs, valves spreading to $\pm 45^\circ$, thin, brittle, septa \pm totally on valve. *Seeds* ellipsoid, ± 0.4 mm long; testa smooth, pale creamish brown, cells subequal to slightly elongate, 50–70 \times 20–40 μ m, anticlinal walls slightly thickened, unevenly undulate, inner periclinal walls with numerous small pits. *Flowering time*: May to September. Figure 3.

Diagnostic features and discussion: within §*Ceramia*, *Erica euryphylla* shares several characters in common with species of the *E. cordata* complex, in particular *E. cordata* Andrews, *E. macrophylla* Klotzsch ex Benth. and *E. ocellata* Guthrie & Bolus. These species also possess 3-nate, broad, open-backed leaves with densely woolly abaxial surfaces, adaxial surfaces with long, simple and gland-tipped hairs and a thickened midrib in the basal and median portions but in all instances not protruding beyond the lamina at the apex of the leaf, stems with long, simple and gland-tipped hairs, sepals with red, stalked glands on the margins, glabrous adaxial surfaces, abaxial surfaces with long, simple and gland-tipped hairs, as well as woolly hairs in the sulcus, globose, 4-locular ovaries with lanate hairs, and manifest, muticous anthers. Variation in the anther morphology of *E. euryphylla* has been noted however, with the occasional flower displaying two minute, aculeate, spreading appendages on the margins of the filament just below the attachment to the thecae. These vestiges of appendages are only clearly visible at a

magnification of 25 \times or more. Such variation pertaining to the presence or absence of anther appendages within a species is not unique, examples being *E. anguliger* (N.E.Br.) E.G.H.Oliv. in which appendages may be present or absent within a single flower (Oliver 2000) and *E. argentea* Klotzsch ex Benth. (Turner in prep.). Significant character differences separating *E. euryphylla* from the *E. cordata* complex include a sparsely hairy, cup- to shortly urn-shaped corolla; variation in the type and placement of the bract on the pedicel (either partially recaulescent, basal to median and reduced, or partially recaulescent, basal and leaf-like) and leaves with only very slightly thickened and rolled-under margins as well as less dense, woolly hairs on the abaxial surface. The habit is generally far more lax than those of the compared species, with the exception of *E. ocellata*, which may have a sprawling habit when mature (Turner pers. obs.). Character similarities and differences between *E. euryphylla* and *E. turneri* are discussed under the latter species in this paper.

Pollination syndrome: the pollination syndrome of *E. euryphylla* is unknown. Although the species has mostly muticous anthers, only occasionally displaying minute anther appendages, it does possess well-developed nectaries and a capitellate stigma, suggesting some form of entomophily. A lack of obvious wind-borne pollen discharge when the plants are disturbed, as occurs in wind-pollinated species such as *E. hispidula* L. and *E. muscosa* (Sol.) E.G.H.Oliv., and the colour of the species' flowers, suggest that it is not wind pollinated.

Distribution and habitat: *E. euryphylla* appears to be endemic in the middle and upper north-facing slopes of the Langeberg Range, on Zuurbraak Mountain and in the Marloth Nature Reserve (Figure 4). It was recorded at the latter locality by Elsie Esterhuysen in 1983 on the Swellendam Trail between Boskloof and Goedgeloof huts and by Dave McDonald in 1989 from the western end of the Langkuilen Valley near Misty Point. Both Esterhuysen's and McDonald's specimens were found growing on similar north-facing slopes, in near-identical habitats to specimens from Zuurbraak Mountain—'in shelter of overhanging rock' and 'in deep shade of rocks' respectively, approximately 15 km west of Zuurbraak Mountain. McDonald cited a latitude and longitude with his collection and a projection of this point would appear to place Esterhuysen's collection no more than 2 km distant.

E. euryphylla has been recorded at altitudes between 1 060–1 340 m, always on a substrate of quartzitic Table Mountain Sandstone (Turner pers. obs.). Plants grow in pockets of quartzitic sand and darker, peaty, organically derived accumulate, in seasonally damp or wet, mostly shady crevices and recesses at the bases of rocks and rock ledges. McDonald's specimen indeed cites a substrate of 'light grey soil with humus'. Associated species are similar to those of *E. turneri* above but with *E. ardens* Andrews, *E. triceps* Link and several low Restionaceae species.

The first stand of the Zuurbraak subpopulation of *E. euryphylla* was found by ecologist and walking partner Nick Helme, only minutes after *E. turneri* was discovered by the author of this species.

Etymology: *E. euryphylla* is named for its broad, open-backed leaves from the Greek words, *eury*s, broad/wide, *phyllon*, leaf—a character displayed by only a few *Erica* species.

Paratype material

WESTERN CAPE.—3320 (Montagu); Marloth N.R., Langeberg, western end of Langkuilen Valley on approach to Misty Point, in deep shade of rocks, 1 300 m, (–CD), 22-11-1989, McDonald 1862 (NBG); Zuurbraak Mountain, Langeberg, shady rock crevices on upper north-

facing slopes below summit, 1 287 m, (–DC), 30-08-2003, Turner 794 (NBG); *ibid.*, 1 333 m, 31-08-2003, Turner 799 (NBG); *ibid.*, 1 312 m, 27-07-2004, Turner 1075 (NBG).

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 TURNER, R.C. in prep. Studies in *Erica argentea* Klotzsch ex Benth. *Bothalia*.

LIST OF *ERICA* SPP. RECORDED FROM ZUURBRAAK MOUNTAIN

- albescens* Klotzsch ex Benth.*
anguliger (N.E.Br.) E.G.H.Oliv.
ardens Andrews*
articularis L.
bracteolaris Lam.
brevifolia Sol. ex Salisb.
caffra L.
cerinthoides L.
chartacea Guthrie & Bolus*
conferta Andrews
corifolia L.
cubica L.
curviflora L.
daphniflora Salisb.
denticulata L.
dianthifolia Salisb.
euryphylla R.C.Turner*
gracilis J.C.Wendl.
grata Guthrie & Bolus
hispidula L.
imbricata L.
intermedia Klotzsch ex Benth. subsp. *intermedia**
longimontana E.G.H.Oliv.*
melanthera L.
multumbellifera P.J.Bergius
muscosa (Sol.) E.G.H.Oliv.
ocellata Guthrie & Bolus*
plukenetii L. subsp. *plukenetii*
podophylla Benth.*
polifolia Salisb. ex Benth.*
regerminans L.
rosacea subsp. *rosacea* (L.Guthrie) E.G.H.Oliv.
tenuicaulis Klotzsch ex Benth.
triceps Link
turneri E.G.H.Oliv.*
versicolor Andrews

* Langeberg endemic species.

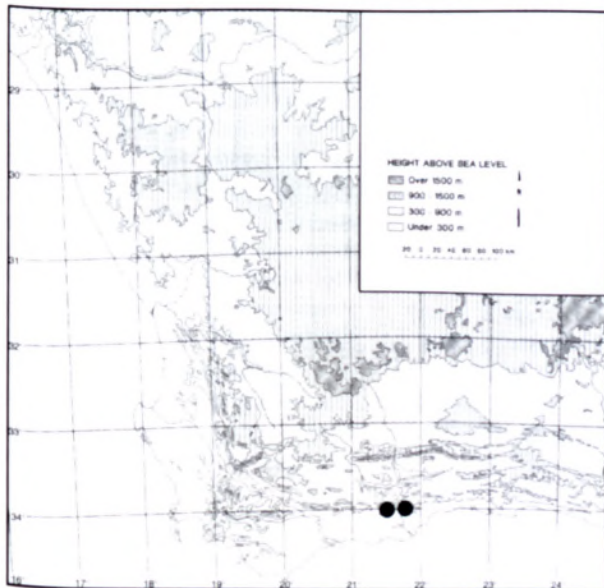


FIGURE 4.—Known distribution of *Erica euryphylla*.